

### **REMARKS/ARGUMENTS**

Claims 1-3, 5-12 and 14-25 are currently pending in the subject application. By the instant amendment, claims 1, 9, 10, 18, 19 and 23 are amended, claim 26 is added and claim 25 is canceled, without prejudice.

Claims 1-3, 5-12, 14-24 and 26 are presented to the Examiner for further prosecution on the merits.

#### **A. Introduction**

In the outstanding Office Action Made Final, mailed April 13, 2005, the Examiner rejected claim 25 under 35 U.S.C. § 112, first paragraph, rejected claims 1-3, 5-12 and 14-25 under 35 U.S.C. § 112, second paragraph, rejected claims 1-3, 5-12 and 14-25 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,766,787 to Watanabe et al. (hereinafter, "the Watanabe et al. reference") in view of U.S. Patent No. 5,919,583 to Grot et al. (hereinafter, "the Grot et al. reference"), and rejected claims 1-3, 5-12 and 14-25 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,635,041 to Bahar et al. (hereinafter "the Bahar et al. reference").

#### **B. Asserted Rejection of Claim 25 under 35 U.S.C. § 112, First Paragraph**

In the outstanding Office action, the Examiner rejected claim 25 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. By the instant amendment, claim 25 is canceled, without prejudice. Accordingly, applicant respectfully submits that the rejection of claim 25 is moot, and withdrawal of the rejection is respectfully requested.

#### **C. Asserted Rejection of Claims 1-3, 5-12 and 14-25 Under 35 U.S.C. § 112, Second Paragraph**

In the outstanding Office Action Made Final, mailed April 13, 2005, the Examiner rejected claims 1-3, 5-12 and 14-25 under 35 U.S.C. § 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner asserted that independent claims 1, 10, 19 and 23 recite both a broad range and a narrow range falling within the broad range. This rejection is respectfully overcome for at least the reasons set forth below.

By the instant amendment, applicant has amended claims 1, 10, 19 and 23 to delete the subject matter that the Examiner asserts is a narrow range. Accordingly, applicant respectfully submits that this rejection be reconsidered and withdrawn.

D. Asserted Obviousness Rejection over the Watanabe et al. Reference in view of the Grot et al. Reference

In the outstanding Office action, the Examiner rejected claims 1-3, 5-12 and 14-25 under 35 U.S.C. § 103(a) as being unpatentable over the Watanabe et al. reference in view of the Grot et al. reference. Applicant respectfully submits that this rejection is overcome by the instant amendment.

By the instant amendment, independent claims 1, 10, 19 and 23 are amended to more particularly recite aspects of the present invention. In particular, these claims have been amended to more particularly recite that the porous support is formed by combining a polymer and the reinforcing agent to form a mixture, then molding the mixture, after which the ion-exchange polymer is applied to the porous support. Applicant respectfully submits that the proposed combination of the Watanabe et al. and Grot et al. references fails to disclose or suggest this aspect of the present invention.

In particular, the Watanabe et al. reference discloses, at most, combining Nafion (an ion-exchange polymer) and a metal oxide, e.g., silica, and molding the mixture to form a membrane. Further, as the Examiner correctly noted, the Watanabe et al. reference fails to disclose a porous support. *Office action of April 13, 2005, at page 4.* The Grot et al. reference discloses, at most, coating a cation exchange resin on a porous support and/or

coating an inorganic filler, e.g., silica, on the porous support. However, neither the Watanabe et al. nor Grot et al. reference, either alone or in combination, disclose or suggest forming a porous support by combining a polymer and a reinforcing agent to form a mixture, then molding the mixture. Further, neither of the references, either alone or in combination, discloses or suggests, after molding the mixture, applying an ion-exchange polymer to the porous support. Accordingly, applicant respectfully submits that claims 1, 10, 19 and 23 are allowable over the cited art. The remaining rejected claims depend, either directly or indirectly, from claims 1, 10, 19 and 23 and are believed to be similarly allowable. Accordingly, applicant respectfully requests that this rejection be reconsidered and withdrawn.

E. Asserted Obviousness Rejection over the Bahar et al. Reference

In the outstanding Office action, the Examiner rejected claims 1-3, 5-12 and 14-25 under 35 U.S.C. § 103(a) as being unpatentable over the Bahar et al. reference. Applicant respectfully submits that this rejection is overcome by the instant amendment.

As noted above, by the instant amendment, independent claims 1, 10, 19 and 23 are amended to recite that the porous support is formed by combining a polymer and the reinforcing agent to form a mixture, then molding the mixture, after which the ion-exchange polymer is applied to the porous support. Applicant respectfully submits that the Bahar et al. reference fails to disclose or suggest this aspect of the present invention.

The Bahar et al. reference discloses, at most, providing a porous membrane and coating various materials on the membrane. Applicant respectfully submits that the Bahar et al. reference fails to disclose or suggest forming a porous support by combining a polymer and the reinforcing agent to form a mixture, then molding the mixture. Accordingly, applicant respectfully submits that claims 1, 10, 19 and 23 are allowable over the Bahar et al. reference. The remaining rejected claims depend, either directly or indirectly, from claims 1,

10, 19 and 23 and are believed to be similarly allowable. Accordingly, applicant respectfully requests that this rejection be reconsidered and withdrawn.

F. New Claim

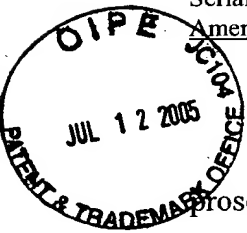
By the instant amendment, applicants have added claim 26. Claim 26 depends from claim 23, and is believed to be allowable for at least the reasons set forth above. Applicant respectfully requests entry and examination of this claim.

G. Reply to the Examiner Regarding Evidence of Non-Obviousness

In the outstanding Office action, the Examiner asserted that the experimental results of non-obviousness, provided by the applicants in the Declaration under C.F.R. §1.132, filed February 3, 2005, did not distinguish over the cited prior art. In particular, the Examiner asserted that the Declaration did not distinguish between the claimed invention and the cited prior art because the experimental results only contained a comparison to a sample lacking a reinforcing agent. *Office action of April 13, 2005, at page 10*. Applicant respectfully disagrees. While the experimental results for "Reference 1" did not include a reinforcing agent, the experimental results for "Reference 2" did. In particular, the experimental results for Reference 2 are for a membrane having a coating including 0.05g of silica. *Declaration of Dr. Hae-Kyoung Kim, page 2*. Thus, applicant respectfully submits that the experimental results set forth in the Declaration are directly relevant to the non-obviousness of the present invention. Accordingly, applicant herewith re-submits the Declaration of Dr. Hae-Kyoung Kim, including Figure 1.

H. Conclusion

Since the cited prior art relied on to reject the claims of the subject application fails to render obvious the present invention, applicants respectfully submit that claims 1-3, 5-12, 14-24 and 26 are now in condition for allowance, and a notice to that effect is respectfully requested.



If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing remarks, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all pending claims is hereby requested.

Respectfully submitted,  
Lee & Morse, P.C.

Date: July 12, 2005



Eugene M. Lee, Reg. No. 32,039

**LEE & MORSE, P.C.**  
1101 WILSON BOULEVARD, SUITE 2000  
ARLINGTON, VA 22209  
703.525.0978 TEL  
703.525.4265 FAX

Attachment:

Declaration under 37 C.F.R. § 1.132 of Dr. Hae-Kyoung Kim.

**PETITION and**  
**DEPOSIT ACCOUNT CHARGE AUTHORIZATION**

This document and any concurrently filed papers are believed to be timely. Should any extension of the term be required, applicant hereby petitions the Director for such extension and requests that any applicable petition fee be charged to Deposit Account No. 50-1645.

If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

Any additional fee(s) necessary to effect the proper and timely filing of the accompanying-papers may also be charged to Deposit Account No. 50-1645.